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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/564,877	05/15/2006	Claude Dehennau	05129-00118-US	5169

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EXAMINER	
MCNALLY, DANIEL	

ART UNIT	PAPER NUMBER
1791	

MAIL DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/564,877	DEHENNAU ET AL.	
	Examiner	Art Unit	
	DANIEL MCNALLY	1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 May 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *9-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *9-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. Claims 9 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rinkewich (US5047193, of record, previously cited, herein "Rinkewich") in view of Dries et al. (US6749933, newly cited, herein "Dries") and Lusignea et al. (US5443884, of record, previously cited, herein "Lusignea").

Rinkewich discloses a method of joining a honeycomb core to facing layers on either side of the core. As show in Figure 1, a core element (3) is continuously produced, plastic facing layers (211) which are considered the "two skins" are produced on either side of the core element, heating means (220a, 220b) such as a laser irradiate energy onto the assembly to heat the inner surfaces of the facing layers and to the ends of the ribs of the core element, the heated portions melt and fuse together. Rinkewich discloses the material of the core element and the facing layers are thermoplastic or thermosetting. From Figure 1 it appears the laser would have to pass though the outside of the facing layers to heat the inner surfaces of the facing layers. Rinkewich is silent as to which part of the assembly is comprised of a laser absorbent material, and to which part of the assembly is comprised of a laser transparent material. Rinkewich is silent also as to the facing layers being uniaxially or biaxially orientated, as well as not destroying the orientation during the laser welding process.

Dries discloses a method of laser welding biaxially oriented films. Dries disclose a conventional laser welding process (column 1, lines 35-45). The use of laser welding allows the formation of a seam or weld only at the area irradiated with the laser so that it is possible to accurately form a weld only at a desired location; furthermore laser welding reduces the thermal loading and mechanical stresses applied to the films. Dries disclose the film comprises a base layer, an outer layer and may comprise additional layers, wherein the outer layer comprises an additive which is absorptive to a wavelength range of laser (column 1, lines 50-62). During the laser welding process the laser energy passes though the other layers of the film, which are transparent to the wavelength of the laser, to the outer layer where the laser energy is absorbed to heat the outer layer, the materials in contact with the outer layer are welded together by the heated outer layer without causing any damage to the other materials or layers though which the laser passed though (column 3, lines 33-46; column 8, lines 37-50). Dries also discloses the film is biaxially oriented, which improves the mechanical characteristics of the film (column 7, line 44 - column 8, line 15).

Lusignea discloses a composite structure. The structure comprises a honeycomb core formed of a plastic material, and face sheets on either side of the honeycomb core. The face sheets comprise a plastic material and are biaxially oriented. The use of biaxially oriented face sheets improves the strength and stiffness of the composite structure. Lusignea provides support that the use of oriented plastic sheets as facings on a honeycomb core was well known.

It would have been obvious to one of ordinary skill in the art at the time of invention to modify method of Rinkewich by using a laser welding method as taught by Dries wherein the facing layers or films comprise multiple layers including a laser absorptive layer which absorbs the laser energy that passes though the laser transparent material and bonds the materials in contact with the absorptive layer, in order to reduce the thermal and mechanical stress on the parts of the assembly and to prevent any damage to the facing layers or films, and by using biaxially oriented facing sheets as taught by Dries and Lusignea in order to improve the strength and stiffness of the honeycomb composite.

With regard to claim 12, Rinkewich discloses as shown in the Figures the core is obtained by a continuous manufacturing process and wherein the welding of the facing layers by means of the laser radiation takes place in line with the continuous manufacturing process.

3. Claims 9, 10 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fell (US5316604 of record, previously cited, herein “Fell”) in view of Dries, Lusignea, and optionally in view of Rinkewich.

Fell discloses a method of making a sandwich structure. The method comprises continuously providing a honeycomb core, providing facing sheets on either side of the core so that the core cell edges contact the facing sheets, wherein the honeycomb core and the facing sheets comprises a plastic material such as polypropylene, a non-contacting heating means heats the core cell edges and the inner surfaces of the facing sheets, the heating means may also heat a bonding film if it is present between the

facing sheets and core, the heated surfaces are heated to their fusion temperature, pressed together and allowed to cool so that a weld is formed (column 3, lines 15-27; column 3, line 53—column 4, line 67). Fell discloses using a non-contacting heating means and provides the example of an infrared radiation source but is silent toward using a laser source. Fell is silent as to the facing sheets being uniaxially or biaxially orientated, wherein the orientation is not destroyed during the welding process.

Dries discloses a method of laser welding biaxially oriented films. Applicant is referred to paragraph 2 for a detailed discussion of Dries.

Lusignea discloses a composite structure comprising a honeycomb core formed of a plastic material, and biaxially oriented face sheets on either side of the honeycomb. Applicant is referred to paragraph 2 for a detailed discussion of Lusignea.

Rinkewich discloses a method of joining a honeycomb core to facing layers on either side of the core. Applicant is referred to paragraph 3 for a detailed discussion of Rinkewich. Rinkewich teaches it was known to use lasers to heat contacting surfaces of a honeycomb assembly.

It would have been obvious to one of ordinary skill in the art at the time of invention to choose laser energy as the non-contacting heating energy of Fell as taught by Dries in order to precisely heat the desired welding areas without wasting energy while decreasing the thermal load on the welded materials, and to modify Fell by using biaxially oriented facing sheets as taught by Dries and Lusignea in order to improve the strength and stiffness of the honeycomb composite, which will not be destroyed during

the welding process as disclosed by Dries, and Rinkewich optionally provides support for using laser energy to heat components of a honeycomb assembly.

With regard to claim 10, Fell discloses using polypropylene.

With regard to claim 12, Fell and Rinkewich disclose continuously providing the core material and performing the welding of the skins inline with the manufacturing process.

4. Claims 11, 12, 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fell, Dries, Lusignea, optionally Rinkewich, and further in view of Pflug (WO00/32382, of record, previously cited, herein "Pflug") and Savitski et al. (US6596122, of record, previously cited, herein "Savitski").

Fell discloses a method of making a sandwich structure. Applicant is referred to paragraph 3 for a detailed discussion of Fell as modified. Fell does not disclose producing the core by thermofolding of a plastic sheet. Fell teaches the absorbent layer is between the facing sheet and the core material, and Dries teaches the absorbent material is on an outer surface of a film; the combination of Dries and Fell do not explicitly disclose placing the absorbent materials at the claimed locations of claims 11, 14 and 15.

Pflug discloses a method of making a honeycomb structure. Pflug teaches a well known method of forming honeycomb cores by providing a thermoplastic sheet, thermoforming the sheet, and folding the sheet to form the honeycomb core.

Savitski discloses a method of welding plastic parts. Savitski discloses it is known to use electromagnetic radiation, such as infrared or laser, to weld plastic

components by transmitting the laser though one of the plastic components to the contacting area between the components to be joined, so that the contacting area between the components is heated and a weld is formed at the exposed contacting area. Savitski discloses forming the plastic components of a laser transparent material and using a laser absorbent material to heat desired locations. Savitski discloses there is a wide variety of combinations and arrangements of transmitting and absorbing materials that can be made. The absorbing material can be an integral part of a first component, a second component or in both components; or the absorbing material can be provided as a part of a separate component placed between the first and second component. One of ordinary skill in the art would have readily appreciated selecting which of the components or surfaces of the components to include the absorbent material so that the contacting area of the components is adequately heated so that a strong weld can be formed between the components.

One of ordinary skill in the art would have readily appreciated forming the honeycomb core of Fell using the well known method of thermoforming and folding a thermoplastic sheet as taught by Pflug in order to produce a honeycomb of an indefinite length, and selecting the desired arrangement of transparent and absorbent materials for the honeycomb core and facing sheets of Fell as taught by Savitski in order to adequate heat the contacting portions and forming a sufficiently strong weld.

5. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fell, Dries, Lusignea, optionally Rinkewich, and further in view of Ducruy (FR2760999, of

record, previously cited, herein "Ducruy") and Savitski et al. (US6596122, of record, previously cited, herein "Savitski").

Fell discloses a method of making a sandwich structure. Applicant is referred to paragraph 3 for a detailed discussion of Fell as modified. Fell does not disclose producing the core by an extrusion process. While Dries teaches the laser absorbent material is in contact between the materials to be welded together, and Fell teaches a bonding thermoplastic material between the facing sheets and the core material, the combination of Dries and Fell do not explicitly disclose placing the absorbent materials at the claimed location of claim 13.

Ducruy discloses a method of making a honeycomb structure. Ducruy teaches a well known method of forming honeycomb cores by extrusion.

Savitski discloses a method of welding plastic parts. Savitski discloses it is known to use electromagnetic radiation, such as infrared or laser, to weld plastic components by transmitting the laser though one of the plastic components to the contacting area between the components to be joined, so that the contacting area between the components is heated and a weld is formed at the exposed contacting area. Savitski discloses forming the plastic components of a laser transparent material and using a laser absorbent material to heat desired locations. Savitski discloses there is a wide variety of combinations and arrangements of transmitting and absorbing materials that can be made. The absorbing material can be an integral part of a first component, a second component or in both components; or the absorbing material can be provided as a part of a separate component placed between the first and second

component. One of ordinary skill in the art would have readily appreciated selecting which of the components or surfaces of the components to include the absorbent material so that the contacting area of the components is adequately heated so that a strong weld can be formed between the components.

One of ordinary skill in the art would have readily appreciated forming the honeycomb core of Fell using the well known method of extrusion processing as taught by Ducruy in order to produce a honeycomb of an indefinite length, and selecting the desired arrangement of transparent and absorbent materials for the honeycomb core and facing sheets of Fell as taught by Savitski in order to adequate heat the contacting portions and forming a sufficiently strong weld.

Response to Arguments

6. Applicant's arguments with respect to claims 9-15 have been considered but are moot in view of the new ground(s) of rejection. Claim 9 was amended to require the skins are uniaxially or biaxially oriented and can be laser welded without destroying the orientation. Applicant argued the previously applied art did not provide any suggestion that the oriented material could be laser welded without destroying the orientation. Newly cited Dries teaches a laser welding method using a biaxially oriented film that is not destroyed during the laser welding method because the film comprises a laser absorptive layer which is heated by the laser and bonds to the contacting layers at the areas where the laser is irradiated.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DANIEL MCNALLY whose telephone number is (571)272-2685. The examiner can normally be reached on Monday - Friday 8:00AM-4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on (571) 272-1226. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Daniel McNally/
Examiner, Art Unit 1791

/John L. Goff/
Primary Examiner, Art Unit 1791

/DPM/
August 6, 2008